

WHAT IS CLAIMED IS:

- 1 1. A method for organizing computer messages generated by a computer script analyzer,
2 the method comprising:
 - 3 analyzing a computer script to generate a plurality of comments about the computer
4 script, each comment of the plurality of comments corresponding to a particular portion of the
5 computer script, each comment identifying a property of the corresponding portion of the
6 computer script;
 - 7 reordering the plurality of comments so as to group together sets of comments having
8 substantially similar identified properties; and
 - 9 generating a result comprising a subset of the plurality of comments ordered in
10 grouped sets.
- 1 2. A method for organizing warning messages generated by a computer program
2 analyzer, the method comprising:
 - 3 analyzing a computer program to generate a plurality of warning messages based upon
4 potentially erroneous portions of the computer program, each warning message of the
5 plurality of warning messages identifying at least one potential error in the computer
6 program;
 - 7 inferring from a subset of the plurality of warning messages at least one suggested-fix
8 heuristic corresponding to each identified potential error in the subset of the plurality of
9 warning messages;
 - 10 associating each suggested-fix heuristic with the warning message containing the
11 corresponding identified potential error;
 - 12 reordering the plurality of warning messages so as to group together sets of warning
13 messages having substantially similar associated suggested-fix heuristics; and
 - 14 generating a result comprising a subset of the plurality of warning messages ordered
15 in grouped sets.

1 3. The method of claim 2, further comprising sub-grouping together at least one subset
2 of at least one of the grouped sets of warning messages, wherein each subset of warning
3 messages identifies potential errors with respect to a particular aspect of the computer
4 program.

1 4. The method of claim 3, where the particular aspect of the computer program
2 comprises at least one of a variable, an object, an object reference, a location in the computer
3 program, and a condition.

1 5. The method of claim 2, further comprising super-grouping together at least one
2 superset of a plurality of the grouped sets of warning messages, wherein each superset of
3 warning messages identifies potential errors with respect to a particular aspect of the
4 computer program.

1 6. The method of claim 5, where the particular aspect of the computer program
2 comprises at least one of a variable, an object, an object reference, a location in the computer
3 program, and a condition.

1 7. The method of claim 2, wherein the generated result further comprises, for each
2 grouped set, a representative suggested-fix heuristic representing the substantially similar
3 associated suggested-fix heuristics.

1 8. The method of claim 7, wherein the generated result does not include the substantially
2 similar associated suggested-fix heuristics.

1 9. The method of claim 2, wherein the generated result identifies, for each grouped set, a
2 representative potential error representing the identified potential errors of the warning
3 messages in the grouped set.

1 10. The method of claim 2, wherein the generated result identifies, for each grouped set, a
2 representative potential error representing a plurality of distinct potential errors identified by
3 the warning messages in the grouped set.

1 11. The method of claim 2, further comprising, when more than one suggested-fix
2 heuristic is inferred for a corresponding identified potential error, duplicating the warning
3 message containing the corresponding identified potential error so that the associating
4 generates separate suggested-fix heuristic / warning message pairs for each suggested-fix
5 heuristic of the more than one inferred suggested-fix heuristic.

1 12. The method of claim 2, wherein the reordering and generating comprise:
2 reordering the plurality of warning messages so as to cluster warning messages
3 together based on classes of associated suggested-fix heuristics; and
4 generating a result comprising a subset of the clustered warning messages.

1 13. The method of claim 2, wherein the substantially similar associated suggested-fix
2 heuristics of each grouped set of warning messages are identical to each other.

1 14. The method of claim 2, wherein the generating further comprises displaying one
2 grouped set of warning messages at a time.

1 15. The method of claim 2, wherein the generating further comprises:
2 ordering the grouped sets of warning messages based on group size; and
3 generating a result comprising a subset of the ordered group sets of warning messages.

1 16. A method of determining an actual error in a computer program, the method
2 comprising:
3 identifying potential errors in the computer program;
4 inferring, for each identified potential error, at least one potential solution;
5 grouping together a set of the identified potential errors having substantially similar
6 inferred potential solutions; and

7 determining an actual error based on the substantially similar inferred potential
8 solutions of the grouped set of identified potential errors.

1 17. The method of claim 16, wherein the substantially similar inferred potential solutions
2 and the grouped set of identified potential errors have characteristics suggestive of the actual
3 error.

1 18. A computer program product for use in conjunction with a computer system, the
2 computer program product comprising a computer readable storage medium and a computer
3 program mechanism embedded therein, the computer program mechanism comprising:

4 a computer script;

5 a computer script analyzer for analyzing the computer script to generate a plurality of
6 comments about the computer script, each comment of the plurality of comments
7 corresponding to a particular portion of the computer script, each comment identifying a
8 property of the corresponding portion of the computer script;

9 a grouping module for reordering the plurality of comments so as to group together
10 sets of comments having substantially similar identified properties; and

11 a result file for generating a result comprising a subset of the plurality of comments in
12 grouped sets.

1 19. A computer program product for use in conjunction with a computer system, the
2 computer program product comprising a computer readable storage medium and a computer
3 program mechanism embedded therein, the computer program mechanism comprising:

4 a computer program;

5 a computer program analyzer for analyzing the computer program to generate a
6 plurality of warning messages based upon potentially erroneous portions of the computer
7 program, each warning message of the plurality of warning messages identifying at least one
8 potential error in the computer program;

9 an inference engine for inferring from a subset of the plurality of warning messages at
10 least one suggested-fix heuristic corresponding to each identified potential error in the subset
11 of the plurality of warning messages;
12 an association module for associating each suggested-fix heuristic with the warning
13 message containing the corresponding identified potential error;
14 a grouping module for reordering the plurality of warning messages so as to group
15 together sets of warning messages having substantially similar associated suggested-fix
16 heuristics; and
17 a result file for generating a result comprising a subset of the plurality of warning
18 messages ordered in grouped sets.

1 20. The computer program product of claim 19, wherein the grouping module further sub-
2 groups together at least one subset of at least one of the grouped sets of warning messages,
3 wherein each subset of warning messages identifies potential errors with respect to a
4 particular aspect of the computer program.

1 21. The computer program product of claim 20, where the particular aspect of the
2 computer program comprises at least one of a variable, an object, an object reference, a
3 location in the computer program, and a condition.

1 22. The computer program product of claim 19, wherein the grouping module further
2 super-groups together at least one superset of a plurality of the grouped sets of warning
3 messages, wherein each superset of warning messages identifies potential errors with respect
4 to a particular aspect of the computer program.

1 23. The computer program product of claim 22, where the particular aspect of the
2 computer program comprises at least one of a variable, an object, an object reference, a
3 location in the computer program, and a condition.

1 24. The computer program product of claim 19, wherein the generated result further
2 comprises, for each grouped set, a representative suggested-fix heuristic representing the
3 substantially similar associated suggested-fix heuristics.

1 25. The computer program product of claim 24, wherein the generated result does not
2 include the substantially similar associated suggested-fix heuristics.

1 26. The computer program product of claim 19, wherein the generated result identifies,
2 for each grouped set, a representative potential error representing the identified potential
3 errors of the warning messages in the grouped set.

1 27. The computer program product of claim 19, wherein the generated result identifies,
2 for each grouped set, a representative potential error representing a plurality of distinct
3 potential errors identified by the warning messages in the grouped set.

1 28. The computer program product of claim 19, further comprising, when more than one
2 suggested-fix heuristic is inferred for a corresponding identified potential error, instructions
3 for duplicating the warning message containing the corresponding identified potential error so
4 that the association module generates separate suggested-fix heuristic / warning message pairs
5 for each suggested-fix heuristic of the more than one inferred suggested-fix heuristic.

1 29. The computer program product of claim 19, wherein the grouping module reorders the
2 plurality of warning messages so as to cluster warning messages together based on classes of
3 associated suggested-fix heuristics, and further wherein the result file generates a result
4 comprising a subset of the clustered warning messages.

1 30. The computer program product of claim 19, wherein the substantially similar
2 associated suggested-fix heuristics of each grouped set of warning messages are identical to
3 each other.

1 31. The computer program product of claim 19, wherein the result file further displays
2 one grouped set of warning messages at a time.

1 32. The computer program product of claim 19, wherein the grouping module further
2 orders the grouped sets of warning messages based on group size, and further wherein the
3 result file generates a result comprising a subset of the ordered group sets of warning
4 messages.

1 33. A computer program product for use in conjunction with a computer system, the
2 computer program product comprising a computer readable storage medium and a computer
3 program mechanism embedded therein, the computer program mechanism comprising:

4 a computer program;
5 a computer program analyzer for identifying potential errors in the computer program;
6 an inference engine for inferring, for each identified potential error, at least one
7 potential solution;
8 a grouping module for grouping together a set of the identified potential errors having
9 substantially similar inferred potential solutions; and
10 a result file for determining an actual error based on the substantially similar inferred
11 potential solutions of the grouped set of identified potential errors.

1 34. The computer program product of claim 33, wherein the substantially similar inferred
2 potential solutions and the grouped set of identified potential errors have characteristics
3 suggestive of the actual error.